

The Reflector



Editor Dr. Mary Ellen Durham

Winter 2024

Update: 2023 K-12 Science Standards Installation

Installation of the new K-12 Science Standards will enter Phase 3 during the Spring and Summer of 2024. In this Phase, the Department of Public Instruction (DPI) will supply resources, provide support, and offer professional development, including face-to-face and virtual training sessions, with Public School Unit Leaders and the Office of Charter Schools. Canvas courses for K-5 and secondary teachers will also be published.

Partnering with DPI, district and school leaders will, in turn, interact with classroom teachers to disseminate implementation and standards updates, coordinate professional learning experiences, ensure sufficient resources are available to the schools, and create common formative assessments. DPI will analyze training session data to determine the effectiveness of the implementation strategies and the relevancy of the professional development activities.

In this phase, science educators are asked to become familiar with the 2023 Science Standards and related crosswalk documents, and to participate in the relevant professional development sessions. They are encouraged to network with their colleagues to develop instructional strategies and create science classroom environments that center on student sense-making.

NCSTA Call for Nominations

If you or someone you know is interested in assuming leadership in advancing, and improving science education, at all educational levels in the state, submit a nomination for a position on the Association's Board. To be eligible one must be engaged in or interested in science education and a NCSTA member in good standing. Board positions open for election in 2024 are President Elect, and District Directors for districts 5 and 7.

NCSTA 2024 President Message

From My First Footprint to Yours



What an incredible year at the NCSTA 2023 PDI! The energy was electric, and it was a joy to connect with so many passionate lifelong learners. The November PDI had a record number of first-time attendees, and their enthusiasm was truly inspiring. Their curiosity and love of learning were contagious, reminding us all of the magic of stepping into a classroom for the first time.

Personally, I vividly remember my own first year at the PDI, when I was a new teacher. One session taught us how to calculate dinosaur heights by analyzing their footprints, and we each got to leave with a T-Rex footprint cast! My smile stretched from one end of the conference hall to the other. It was a reminder of the power of collaboration and shared experiences.

This year, we're thrilled to dedicate our first edition of the Reflector to supporting early career teachers by providing them with news and impactful resources. Our board boasts years of diverse teaching experience, expertise, and a passion for science education.

In addition, you'll get to know your NCSTA Board members even better. We'll be highlighting your district directors, showcasing their unique contributions, and explaining how they can support you. We also encourage you to share classroom or school achievements with your district directors, as well as any successful activities you've developed. We're eager to learn from each other and celebrate one another's successes! Remember, the magic of learning never fades. Keep exploring, collaborating, and growing!

Tom Savage



The 2024 North Carolina Science Teacher Association Board

NCSTA is governed by a Board of Directors consisting of officers and district directors who are elected by the membership, as well as president appointed committee chairs. These individuals, who are actively engaged or interested in sound science education, work collaboratively to promote the advancement, stimulation, extension, improvement, and coordination of science teaching in all fields of science at all educational levels throughout the state. The elected officers who make up the 2024 Executive Committee are:

- President: [Tom Savage](#)
- Past President: [Cliff Hudson](#)
- President Elect: [Adrienne Evans](#)
- Treasurer: [Carol Maidon](#)
- Secretary: [Brad Woodard](#)



The membership within each of the 8 districts elects a director to serve on the Board as their region's official representative. Directors oversee NCSTA's programs and promote the Association's objectives within their respective regions. Directors disperse, to his or her district, pertinent NCSTA and science education information, as well as relay back to the board district concerns, needs and news. By maintaining this communication exchange, directors help the board to address the membership's professional needs and promote the goals of the Association. Click on your district director's name to share news and updates from your area.

District 1 is [Jennifer Stalls](#).

Jennifer serves Hertford, Gates, Perquimans, Pasquotank, Pitt, Currituck, Camden, Bertie, Dare, Martin, Beaufort, Hyde, Tyrell, Washington, and Chowan Counties,



District 2 Director is [Michelle Hafey](#).

Michelle Serves Sampson, Wayne, Lenoir, Greene, Craven, Pamlico, Onslow, Jones, Duplin, Carteret, Pender, New Hanover, and Brunswick counties.



District 3 Director is [Lottie Peppers](#).

Lottie serves Durham, Granville, Wake Vance, Warren, Johnston, Wilson, Nash, Edgecombe, Halifax, Franklin and Northampton counties.



District 4 Director is [Kelly Ficklin](#).

Kelly serves Robeson, Richmond, Scotland, Montgomery, Columbus, Bladen, Hoke, Cumberland, Harnett, Lee, and Moore Counties.



District 5 Director is [Brad Rhew](#).

Brand serves Stokes, Forsyth, Davidson, Rockingham, Guilford, Randolph, Caswell, Person, Orange, Alamance, and Chatham counties.



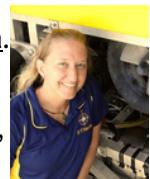
District 6 Director is [Carie Fugle](#).

Carrie serves Anson, Union, Stanly, Cabarrus, Rowan, Mecklenburg, Gaston, Lincoln, and Cleveland counties.



District 7 Director is [Lindsay Smith](#).

Lindsay serves Davie, Alexander, Iredell, Yadkin, Surry, Wilkes, Alleghany, Catawba, Ashe, Watauga, Caldwell, Burke and Avery counties.



District 8 Director is [Jill Francis](#).

Jill serves Cherokee, Graham, Clay, Swain, Macon, Haywood, Jackson, Transylvania, Madison, Buncombe, Henderson, Yancey, Mitchell, McDowell, Polk and Rutherford counties.



The following board members serve as NCSTA committee chairs and professional organization liaisons. They provide vital information to the greater Association's leadership regarding the status of science education throughout the state and spearhead the collaborative efforts necessary for the planning and implementation of the Association's professional activities.

- Sandra Weitzel Membership Committee, Goals Committee
- Carol Maidon Finance Committee, Constitution and By-Laws Committee
- Joshua Hunter Nominations and Elections Committee
- Brian Whitson Communications Committee
- Mary Ellen Durham Publications Committee, The Reflector Editor
- Cliff Hudson Conference (PDI) Planning Committee
- Jennifer Stalls Awards Committee
- Jobi Cook Curriculum and Study Grants Committee
- Manley Midgett PDI Sponsorship Committee, Trust Fund Committee
- Jennifer Crawford Student Competitions Committee
- Adrienne Evans Non-Public Schools Committee
- Lisa Tolley Nontraditional/Nonformal Science Education Committee
- Laura Lowder Preservice Teachers Committee and University Liaison
- Brad Woodard History and Records Committee
- Kristen Kane Legislative Committee
- Jennifer Crawford Student Competitions Committee
- Dachele Gupton Diversity and Equity Committee
- Brad Rhew NCSLA Liaison
- Gavin Fradel DPI Liaison
- Carrie Jones NSTA Liaison



Spotlight on Ann McClung, North Carolina's Robotics Queen



Former NCSTA president and veteran Pitt County Science teacher, Ann McClung, is playing a prominent role in promoting STEM education. Ann is currently a Science Coordinator at the Stem Center, East Carolina University in Greenville, NC. In this capacity she assists teachers and students throughout northeastern North Carolina to acquire the resources and materials necessary for learner centered science instruction, coordinates and hosts Science Olympiad Regional Tournaments, and manages AP Summer Institutes. Her work also provides a venue to introduce teachers and students to ROBOTICS!

Ann's passion for robotics began 17 years ago while teaching high school science. She was asked by her administration to sponsor a robotics club. As she accepted this new assignment, she quickly determined that robotics was an invaluable resource that generates scientific curiosity and engages learners holistically in exploring all the STEM subjects. Since that time, Ann has encouraged numerous North Carolina schools to host robotics clubs and participate in North Carolina First Robotics Competitions (NCFRC). The goal of NCFRC is to assist teachers in showcasing the interconnections of the STEM disciplines while introducing learners to STEM-related careers. Support and resources are provided to teachers and students so they may participate in robotic contests. In these competitions, teams of middle or high school students are challenged to build industrial-size robots that play a difficult field game in alliance with other teams. Each robotic team must also design a team "brand" and fundraise to meet their goals.

Ann is the lead mentor for the Pitt Pirates Robotics Team 2641 and PiRates 12735 FTC Team. She works with middle and high school students throughout the year building robots and guiding the teams through competitions. She also hosts summer robotics camps at the North Carolina Museum of Natural Sciences.

Recently Ann and Carson Fraley, a J. H. Rose High School student who under Ann's mentorship has engaged multiple years in Robotics, were interviewed by Pitt County Public Schools. One can hear this podcast at: Episode 5: Pitt Pirate Robotics

Greetings from Washington: Your Albert Einstein Fellow Update

By Dorothy Holley



Happy 2024! I certainly hope the new year has started well for my fellow North Carolina science educators. It was a joy to reconnect and meet so many of you this past November at the NCSTA DPI.

I am currently back in Washington, D.C., continuing my tenure as an Albert Einstein Fellow (AEF). The AEF program is designed to “increase the understanding, communication, and cooperation between the Congress, the Department of Energy, other Federal agencies, and the mathematics and science education community.” I, fortunately, work for a member of congress who serves on the Education and Workforce Development Committee (EWDC). Although this committee may not have grabbed headliner news lately, there have been some rather dramatic and important activities, including hearings on school lunch milk, books in libraries, and college presidents. In addition to attendance at committee briefings and hearings, I am charged with making suggestions and providing “my congress member” with pertinent and accurate information regarding the issues before the EDWC. This requires a lot of reading and research. There is a whole nonpartisan “library” with information on every issue imaginable, in which I have spent a great deal of time. I meet with constituents to directly identify concerns and investigate regional and local policies. I then couple the gathered information and make recommendations to “my congress member” clarifying how legislation would impact his/her specific district. The entire process has proven to enhance my curiosity regarding numerous educational issues, particularly AI.

The Professional Development (PD) opportunities that are afforded me are exceptional. The AEF program offers professional development activities once a month, and the members of my cohort also plan a (PD) program once a month. To provide a development opportunity for the other Fellows, I collaborated with two of my new cohort friends and we presented “A Day in the Life of a Capitol Hill Fellow”. During this program we took the rest of the cohort through coffees, meetings, legislation, and a walk onto the House of Representatives floor. In another PD experience we visited the Library of Congress where we saw Hook’s original drawings which he made as he looked under a microscope. (It’s more amazing than you could even imagine!) We’ve done book studies with PISA data and modeled AI to go fishing. We also participated in professional development programs at the National Museum of African American History and Culture and the National Academies of Science. Additionally, AEF provides each fellow a budget to cover other Professional Development expenses. As I write this, I am in Tucson, Arizona attending a SEEDS conference (Science Educators for Equity, Diversity and Social Justice). It has been an amazing adventure where I have learned about saguaro cacti and critical liberatory presencing.

My Washington experience has not been completely consumed by work. I have had the extraordinary opportunity to explore and participate in some of the Capital’s incredible offerings. I have visited every Smithsonian Museum on the National Mall, attended “To Kill a Mockingbird” and heard Joshua Bell at the Kennedy Center. I was present at the Golden Goose Awards, said goodbye to the Pandas at the National Zoo. I heard the Black Hole Symphony and enjoyed the weekly summer Military Concerts including a Veteran’s Day Concert at the National Cathedral. I was present at the Educators nights at the Natural History Museum and the Asian Art Museum, I attended trick-or-treating on Embassy Row and the Stratovarius Concert. I witnessed the National Christmas Tree lighting, Capitol Christmas Tree lighting, National Menorah lighting, and the annual boat parade at the Wharf. Every moment of my fellowship has been filled with challenging and thought-provoking opportunities which I look forward to sharing with other science educators upon my return to North Carolina.

Until my next update, may you and your students have a wonderful semester.

Attention AMAZING 7th Grade Educators

By Janina Millis



There is still time to get your students involved with the NC Division of Air Quality's AQ-IQ contest as the final date for students to submit their projects is **Monday, MARCH 11, 2024, by midnight.**

Open to all seventh graders in North Carolina, the AQ-IQ Contest provides students an opportunity to learn about air quality and to generate solutions that address air pollution. It puts the learners in charge of developing an original project to educate others about air quality problems. Past projects have included posters, videos, Minecraft creations, games, books, and other varied artistic designs. Imaginative and creative approaches to the project are encouraged.

The Annual AQ-IQ contest grants special awards for the outstanding projects meeting the competition criteria within designated special categories. This year, the special categories are as follows:

Wildfires and Planned Burns, Electrify Everything, The Air Quality Forecast

Depending on the number of statewide entries, a larger statewide AQ-IQ award ceremony may be held in June or July (location and specific date to be announced). In general, an entry is judged against other entries from their specific region. The best regional projects may then be evaluated in the statewide AQ-IQ Contest for a state-level award.

Students will need to follow the step-by-step Student Worksheet guide (see below) to develop an AQ-IQ project. Once completed, students submit their projects using the online form linked below. Students are to include both their teacher's and parent's emails, as well as their project's bibliography, when submitting.

If students are creating a physical project (sculpture, board game, artistic drawing, poster, etc.), we ask students to submit multiple pictures of their creations. The more judges can see and read, the better a student's score will be (and we want to see all of their hard work)!

For more information on the AQ-IQ contest, you can also visit the [NC Environmental Education](#) webpage. For the Student Worksheet Guide:

<https://web.eenorthcarolina.org/Files/ncee/2023/20232024aqiqstudentworksheet.pdf> or
<https://web.eenorthcarolina.org/Files/ncee/2023/20232024StudentWorksheetword.docx>

Student Project Submittal Form: <https://ncdaq.wufoo.com/forms/z1f26nga0d7yioc/>

If you have any questions, please contact Keith Bamberger at keith.bamberger@deq.nc.gov or Janina Millis at janina.millis@deq.nc.gov, or through our NC Air Awareness email (air.awarness@deq.nc.gov)

Award Winner, Terri McLeod

Terri McLeod, K-5 STEM Specialist for Kingswood Magnet Elementary School in Cary, N.C., was named Environmental Educator of Year at the 59th Annual Governor's Conservation Achievement Awards Banquet. McLeod, nicknamed "the plant lady", was recognized for her exceptional contributions to environmental education at Kingswood Elementary and the surrounding Cary Community. Her incorporation of environmental science activities in the elementary curriculum were identified as creating a transformative and lasting impact on student learning during the Award presentation. She was also credited with generating a deep appreciation for science and the natural world among young learners. NCSTA applauds Ms. McLeod upon receiving this honor.

WINNER

North Carolina Teen Earns Perfect Score!

Yash Shah, a student at Panther Creek High School in Cary, N.C. is one of only 23 students worldwide to earn a perfect score on the Advanced Placement Chemistry Exam! The odds of achieving a perfect score on the exam are 0.02%. His top 20 finish on the National Chemistry Olympiad Exams earned him a spot in the 2023 U.S. National Chemistry Olympiad Select Study Camp. Shah's interest in the field continues, as he is currently enrolled in an Organic Chemistry course at N.C. State University. He hopes to finish in the Top 4 in this year's National Chemistry Olympiad Exams which will provide him the opportunity to represent the United States at the 2024 International Chemistry Olympiad. NCSTA recognizes the Science Faculty at Panther Creek High School for providing the support and learning opportunities which continue to assist Yash Shah in reaching his chemistry goals.

Call for Information!

The Reflector wishes to acknowledge North Carolina Students who excel in science activities. If you know of a student, or group of students who are science award winners, or have demonstrated excellence in a science related activity please send that information to either your District Director or to Mary Ellen Durham, editor of the Reflector, so these individuals can be recognized.

by Jobi Cook

Do you have an exciting project that you would like to bring to your classroom or school? Would you like to attend a workshop or conference to discover new STEM resources to bring back to your district?

Attention Educators! NCSTA Grants

There are two grant opportunities available for educators:

- NCSTA Innovative Curriculum Support Grant
- NCSTA Study Grant

Proposals are accepted in the spring (deadline March 1, 2024) and fall (deadline September 1) via an online application. For more information, visit: <https://www.ncsta.org/grants/>

NCSTA District 6 School Communities Receive National Wildlife Federation Recognitions



The National Wildlife Federation (NWF) recognizes communities throughout the country that demonstrate an outstanding commitment to providing wildlife with food, water, cover, and places to breed and raise young through sustainable gardens located within developed commercial and residential areas. These "gardens" are protected habitat concentrations in locations where high levels of human activity and construction have fragmented the natural environments of indigenous plants and animals.

This year, the NWF recognizes school communities in Charlotte, Matthews, Concord, and Marvin, North Carolina for supporting 167 sustainable wildlife gardens. According to the National Wildlife Federation's 50th year celebration of Gardens for Wildlife, these school-based "gardens" are engaging students and educators in outstanding environmental science learning experiences, as well as providing essential protection and support for the native flora and fauna of North Carolina's piedmont.



Science Teachers! Discover Forestry in North Carolina

By Jessica Ireland



The North Carolina Forestry Association is currently accepting applications from North Carolina educators for the 2024 Sustainable Forestry Teachers Experience. The Application deadline is March 1, 2024. This professional development workshop will be conducted this summer and provides opportunities for the participants to explore all aspects of sustainable forestry in the state. Participants will tour North Carolina forests and forestry facilities, become familiar with the state's sustainable forestry practices, and gain knowledge and resources to bring back to their respective classrooms.

Two Sustainable Forestry Teacher Experience workshop sessions are available: July 22-25 based out of Wilmington, NC and July 29-August 1 based out of Asheville, NC. Transportation, lodging, and meals are provided during the four-day workshop for the participants. Professional development training along with activity guides in Project learning Tree will be offered. Teachers who participate in the workshop are eligible to receive CEUS and North Carolina environmental education certification credits. Click [Sustainable Forestry Teachers Experience](#) for more information.

Unique Field Trip for WCHS Students



The West Cabarrus High School (Concord, North Carolina) Honors Botany class recently participated in an interdisciplinary field trip to Reedy Creek Nature Center and Preserve. The Center and Preserve are situated on the remains of an 1800's plantation in Mecklenburg County NC, and protects 737 acres of forest, wetland and stream habitats. On the trip the students explored, through a historical perspective, how human enterprise directly impacts the environment. The class participated in a nature walk through the preserve, viewed the herbarium and visited the Dr. James Matthews Center for Biodiversity Studies. NCSTA applauds Carrie Fugle, West Cabarrus High School science teacher, for coordinating this exceptional learning experience for her students.

Wildlife Passages and N.C. Roads



The US Congress has made a major environmental investment by providing \$350 million for a Wildlife Crossing Pilot Program. This funding, granted through the passage of the Bipartisan Infrastructure Law, is intended to establish animal road crossings in all 50 states. As collaborations between the Department of Transportation (NCDOT) and the Wildlife Commission have already resulted in 26 wildlife crossing structures within the state, North Carolina is recognized as a national example for this environmental effort. The state has demonstrated cutting-edge efforts to reduce highway hazards for motorists and wildlife, while minimizing habitat fragmentation. These crossing structures include underpasses, overpasses, and fencing along interstates, highways, and roads.

Recently the N.C. Wildlife Resources Commission and the (NCDOT) recognized the need to continue their collaboration in order to address the state's burgeoning population, expanding number of vehicles, amplifying development-related changes to habitats, and increasing dangers to wildlife. The agencies agree there must be greater protections for both drivers and animals statewide. NCDOT data indicates that about 7% of all reported vehicle crashes in the state involve animals strikes. Additionally, the majority of these vehicle/animal accidents occur during dawn and twilight, a time interval when animals are typically feeding and on the move.

NCDOT and the N. C. Wildlife Resource Commission have signed a memorandum of understanding, forming a partnership aimed at developing efficient and effective passages for wildlife that lessen highway hazards for motorists, reduce collision-related wildlife mortality, and minimize the fragmentation of habitats. Currently the two agencies are collaborating on 11 additional wildlife passage projects. Both Agencies are asking The North Carolina General Assembly to allocate financial resources to wildlife passages that could be leveraged to match the newly available Infrastructure Law's Wildlife Crossing Pilot Program funds.

District Highlights

District 1

The Vision 2024 Conference, hosted by NC East Alliance, was held on January 19, 2024, at East Carolina University. The conference served as the official “kickoff” of the planned STEM East Industry in Schools Initiative. Included in the conference agenda were a STEM East Industry in Schools panel discussion, a legislative panel discussion, a STEM Schools of Distinction panel discussion, and an Eastern NC Economic Update from Laura Ullrich of the Federal Reserve Bank of Richmond. The 300 plus individuals attended including representatives from Eastern North Carolina school districts, industries, and higher education.

The North Carolina Future City Competition recently took place in Raleigh, NC. Two district one schools won special awards:

Hope Middle School, Pitt County Schools, Best Land Surveying Practices
Wellcome Middle School, Pitt County Schools, Best Use of Public Transportation

- The ECU Science Olympiad Division B/C tournament will be held at East Carolina University on Saturday, February 17.
- The Pitt NC Science Olympiad Division A tournament will be held at JH Rose on Saturday, March 16.
- The Elizabeth City Science Olympiad Division A, B and C Tournaments are scheduled for March 2, 2024, College of the Albemarle, Elizabeth City, NC.

Port Discovery, Northeast UNC Center for Hands-On-Science, will be using VEX robotics kits to teach programming and coding to students residing in northeastern North Carolina. Sessions will be in the STEM Laboratory above Port Discover in Elizabeth City. For more information contact, gavin@portdiscover.org

District 2

Brunswick, Sampson, and Wayne School Districts were chosen by the NC Teaching Fellows Program Commission to receive a \$50,000 teacher recruitment grant. They expect the grant to renew each year for 4 years. This is in response to an interest in expanding a grow your-own teacher program.

The following events will be hosted by the Center for Education in STEM (CESTEM) and will take place on the UNCW campus.

- Region 2 Science and Engineering Fair - Saturday, February 10, 2024
- Wilmington Regional B/C Science Olympiad Tournament - Saturday, March 9, 2024
- Wilmington Regional SeaPerch Competition - Saturday, March 16, 2024

Division A Science Olympiad Regional Tournaments

- Brunswick County - April 20, 2024 (tentative) at Shallotte Middle School
- Lenoir County - March 16, 2024, at Contentnea-Savannah K-8 School
- New Hanover County - March 2, 2024, at Eugene Ashley High School
- Onslow County - April 6, 2024, at Northside High School
- Pender County - February 17, 2024, at Heide Trask High School

PK-12 STEM Education Conference hosted by UNCW’s CESTEM is scheduled for Thursday, June 20, 2024. Registration will open soon. For more information visit www.uncw.edu/cestem for more details or contact Michelle Hafey at hafeym@uncw.edu.

District 3

Wake County Public School System:

- Elementary schools are hosting science fairs and science olympiads this month with the goal of competing in the Regional Science Fair and Science Olympiad.
- "Exploring the SEPs" Professional Learning has continued to be presented to middle and high school science teachers in preparation for the implementation of the updated science standards. Additional training for elementary teachers is happening at the end of the month.
- The Raleigh Regional Science Olympiad Tournament took place at Southeast Raleigh Magnet High School on Saturday, February 3rd.
- NC State and the Wake County STEM Leadership Committee will host its first annual Design & Pitch Challenges in STEM pitch competition on Saturday, April 6 at the Friday Institute for Educational Innovation.
- The National Society of Black Engineers (NSBE) chapter at North Carolina State University and WCPSS STEM Consortium Schools are working collaboratively to excite and inspire students about Engineering! NSBE members are facilitating hands-on engineering experiments with students at multiple schools in the Consortium, as well as hosting a shadowing day experience at NCSU for high school students.

District Highlights

District 3 continued...

- The wearable device challenge is open to middle or high school students within driving distance of NC State University. The challenge integrates the One Health Initiative concepts and the Grand Challenges of Engineering to create a competition where students will be tasked with designing a wearable device to monitor the health of a human or animal based on environmental factors and/or disease transmission.

Durham Public Schools

- DPS is training teachers about the science and engineering practices through district-wide, grade-level PLCs for 5th through 8th grade.
- DPS is developing materials for sheltered ESL Biology with our ESL department.
- DPS is looking forward to our two regional Science Olympiad tournaments in February and March.

The North Carolina Museum of Natural Sciences and the Raleigh Astronomy Club will host Astronomy Days February 3-4, 2024, at the museum. The Museum of Life and Science will sponsor the 2024 Youth Climate summit for high school students on February 19, 2024, in Durham, NC.

District 4

The Harnett County Division A Science Olympiad Tournament will be on April 27, 2024 at Overhills Elementary School. Cumberland County Schools elementary Science Olympiad will be at Jack Britt High School on April 13, 2024. Fayetteville Technical Community College will host Science Olympiad Tournaments, Divisions B and C, on February 10, 2024. The Fascinate U Children's Museum in Fayetteville will hold its annual Family Super Science Funfest in April this year.

District 5

District level Science Fairs were held throughout January. East Forsyth High School will host the Region 5 Science Fair on February 17, 2024. Kaleideum, an interactive discovery center that combines literacy, arts, and Stem is relocating in downtown Winston-Salem. Tickets for the February 17th grand opening of Kaleideum's new facilities are now available. Click on <https://kaleideum.org/> for addition information regarding visits and field trips.

District 6

The Phillip O Berry Academy of Technology will host the Mecklenburg Science Fair Division B and C Tournaments on February 17, 2024, and the Division A Tournament on April 27, 2024.

Earth Jam 2024 hosted by Happy Roots, an informal educator in Rowan County, is set for April 20th in Salisbury, NC. This Earth Day fundraising event will support the outreach programs that allow school and community gardens, horticulture therapy, and environmental stewardship to be accessible to the region. This event includes environmental vendors and sponsors, food trucks, and live music! More information about Happy Roots can be found on their website. To encourage sky gazing among all age groups, the planetarium staff at the Schiele Museum in Gastonia, NC is hosting 3 Telescope Parties. These will occur on February 16, March 15, and April 19, 2024. No experience of equipment is necessary to participate.

South Stanly Middle School teacher, Kristin Owens-White, has received her EE Certification and school board approval to add an Outdoor STEM course.

District 7

The 27th Annual Convention of Amateur Astronomers was held this past January at Catawba Science Center in Hickory, NC. In addition to skygazing, attendees were able to participate in multiple round table discussions and concurrent sessions and to hear a keynote address from John Horner.

Science Olympiad Tournaments, Divisions B and C will be held at Catawba Valley Community College on March 9, 2024.

District 8

The North Carolina Region 8 Science and Engineering Fair will be held in the Apodaca Science Building on the campus of Western Carolina University on Thursday, February 8th (grades 3-5) and Friday, February 9th (grades 6-12), 2024. The deadline to register for the fair was Friday, February 2nd.

NC Science Olympiad Regional Tournament (Divisions B & C) - Feb 10, UNC-Asheville

There are multiple Kenan Fellowship opportunities available for teachers in the Western Region. Apply as soon as possible to allow for interviews in February. <https://kenanfellows.org/apply>.

Awards

The North Carolina Science Teachers Association (NCSTA) is thrilled to announce the opening of nominations for the following prestigious awards.

Outstanding Student Teacher in Science Award (Elementary, Middle, and High)

District Outstanding Science Teacher Award (Elementary, Middle and High) for all NCSTA Districts

Distinguished Service in Science Education in North Carolina Awards for the following categories: Elementary School Middle School High School College/University

Administrator/supervisor

Non-school setting

Commercial

Vi Hunsucker Award

Nominations are open and must be submitted by May 31, 2024

Click on <https://www.ncsta.org/awards/> to learn the eligibility criteria for each of these awards.

These awards recognize and celebrate the exceptional contributions of science educators who have demonstrated unwavering dedication, innovation, and excellence in the field of science education. We invite all members of the North Carolina science community to participate in this important process by nominating individuals who have made a significant impact on science education. This is an opportunity to acknowledge and honor outstanding professionals who go above and beyond to inspire and educate the next generation of scientists and thinkers.

How to Nominate:

To nominate a deserving candidate, please visit our [online nomination form](#). Complete the form with the nominee's details and provide a compelling statement explaining why you believe they deserve recognition.

Awards Presentation:

The winners will be honored at the upcoming NCSTA Annual Professional Development Institute. Your participation in this nomination process is crucial in ensuring that deserving science educators receive the recognition they deserve. Together, let's celebrate the passion and dedication of those who shape the future of science education in North Carolina. NCSTA thanks you for your support and looks forward to receiving your nomination.



NC Envirothon

The North Carolina Envirothon, a natural resource education program, challenges middle and high school student teams to demonstrate their knowledge of wildlife, forestry, aquatic, soil and land use, ecology and current environmental issues. To be eligible for the State competition, teams must register, compete and qualify at a regional event. For more information: [NC Envirothon](#).

The 2024 Regional Competition (<https://sites.google.com/site/envirothonnc/general-info/dates/nc-area-envirothons>) dates follow:

Area 1 March 12; **Area 2** Middle School, March 26 and High School, March 27; **Area 3** March 12
Area 4 March 14; **Area 7** March 21; **Area 8** Middle School March 19 and High School March 20;
Area 5 & 6 March 12

The State competition will be held April 26-27, 2024, at Cedarrock Park in Burlington, NC.





Look Up



Several interesting celestial events are visible from February to mid-April in North Carolina.

February 7, Venus's proximity to Moon About 1/2 hour prior to sunrise the waning crescent Moon can be seen to the lower right of Venus. Venus will appear very bright. One may also see Mercury near the horizon to the lower left of Mars.

February 14, Golden Jupiter If searching for a romantic sight for Valentine's Day, look toward the western sky this evening. A golden Jupiter will appear to the upper left of the waxing crescent Moon from twilight until about 11 pm. Despite the Moon being 1/3rd illuminated, you should be able to glimpse the darkened portion of the lunar surface glowing with Earthshine.

February 22, Mars/Venus Conjunction The conjunction of Venus and Mars will display a contrast between brightness and color. About 1/2 hour before sunrise, a copper colored (Mars) will be seen to the lower right of the brilliant white Venus.

February 24, Snow Moon This full Moon is called the Snow Moon by native Americans as winter snow and icy weather often occur immediately prior to or following its occurrence in the northern hemisphere. The Moon actually "turns full" at 7:31 AM (eastern time) within the constellation Leo. (If you view the Moon the evening of the 23rd, you will see the almost full Moon about 3.5 degrees east of Regulus, the brightest star in the Leo constellation.

For easy star identification, follow the Moon's phases throughout February. Viewing the last quarter phase during predawn hours on **February 1** Spica will appear closest to the Moon. Castor and Pollux will be visible close to the waxing gibbous Moon in the evening of **February 20**. Spica will be visible in the early morning hours near the waning gibbous Moon on **February 28**.

March 8, Moon and Closest Neighbors The Moon will appear beside our two closest planetary neighbors during predawn hours. Venus will be very low over the horizon, with Mars glimmering to its upper right. The crescent Moon will appear below Mars and to the right of Venus.

March 13, Jupiter In the evening Jupiter will appear slightly left of the waxing crescent Moon as the giant planet approaches its closest orbital position to the sun. Earth shine may illuminate the darkened lunar surface. The constellation Pleiades will appear above the planet/moon pair.


March 24 Mercury's Greatest Eastern Elongation Just prior to sunset, one can view Mercury at its greatest angular distance from the sun. The planet will appear about 15 degrees above the western horizon.

March 25 Worm Moon and Penumbral Eclipse As this full lunar phase occurs at the same time of year that indigenous people witnessed worms emerging from the ground following winter frosts, it is called Worm Moon. The appearance of the Worm Moon at 2:59 AM coincides with its passing through the outer portion of the Earth's shadow (penumbra), thus causing a penumbra eclipse. This event will be visible in the piedmont and western parts of North Carolina.

Following the lunar phases through March will allow one to see the following stars: During the night of **March 18** the waxing Moon will be close to Castor and Pollux; **March 21** Regulus will appear close to the waxing gibbous Moon at night; Spica will appear close to the full Moon on **March 26**; and Antares will be seen close to the waning gibbous Moon early in the morning on **March 20**.

April 6, Moon and Double Planets 45 minutes prior to sunrise Saturn will appear as a faint yellowish orb about 2 degrees above the moon with coppery Mars to the right of the pair.

April 8, Solar Eclipse The total solar eclipse path runs from Mexico through Texas, Oklahoma, Arkansas, Missouri, Illinois, Indian, Ohio, Pennsylvania, New York, Vermont, and Maine. A partial eclipse will be visible from the western to middle part of North Carolina between 11:40 am to 2:50 pm.

April 22, Lyrid Meteor Shower Although the Moon will be almost full and will brighten the sky, the predawn hours of the 22nd and 23rd of April will offer the best opportunities to see meteors in the eastern sky. 

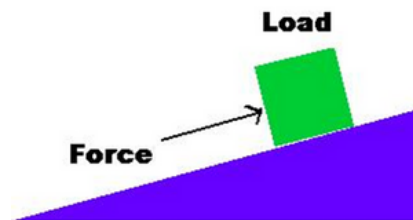
Teaching Tip

INCLINED PLANES

by Manley Midgett

As with other types of simple machines, inclined planes don't get you out of doing work; they make the work easier. If you want to lift a certain mass to a certain height, you can multiply its mass times the height to be lifted to calculate the work done. If a ramp or inclined plane is used to lift the same mass, the force needed to slide it up the ramp is less than what was needed to lift it without the inclined plane. So, it is easier to lift the mass. However, more work is done because the mass must be moved a much larger distance to lift it to the same height.

Examine drawings of inclined planes. Ask students to label the resistance and place where the effort will be needed to move the resistance in each case.



Activity: Ramp It Up!

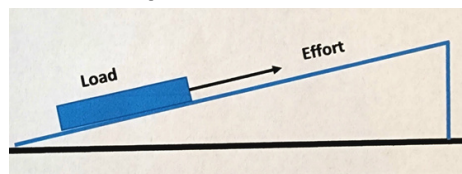
Give teams of three students the following materials: one wide board to serve as the ramp (1" x 6" x 30"), two small blocks (2" x 4" by 6"), one block with an eyehook (2" x 4" x 12"), a spring scale, ruler, and a meterstick.

First, ask students to observe the spring scale and how it works. It can measure the downward force of gravity on an object. The spring scale may show grams and Newtons on its scales, but use Newtons to measure force.

Next, ask students to lift the large block using the spring scale to measure the force needed to lift it. (The large blocks have been cut to require a force of close to 5 Newtons to lift them.) Point out that this is the force needed to lift the block without using a simple machine. In this case, the effort needed to lift the block is the same as the load or resistance.

Now, make a ramp that is 10 cm high on one end. Use the small block to help you do this and use the ruler to make sure the height is 10 cm. from the table to the highest edge of the ramp. Lay the large block on the ramp with the eyehook on the uphill end.

Example Inclined Plane



Trial	Resistance (Newtons)	Ramp Height (cm.)	Ramp Length (cm.)	Effort Force (Newtons)	IMA	AMA
1		10				
2		20				
3		30				

$$\text{IMA} = \frac{\text{Ramp length}}{\text{Ramp height}}$$

$$\text{AMA} = \frac{\text{Resistance force}}{\text{Effort force}}$$

Ask students to predict the force needed to lift the block using the ramp. One student can hold the ramp, so it doesn't move. The other student can hook the spring scale to the block and slide it along the surface of the ramp to the top. Be sure to read the force needed on the spring scale as it is moving. It will read higher at first because you have to overcome friction to get it to move. (NOTE: If you were going to weigh yourself on an elevator, you would not want to read the scale just as the elevator lifts or as it reaches the top and stops. You would have to weigh yourself as it is moving to get an accurate weight.)

How does the force needed to lift the block to 10 cm. of height using the inclined plane compare to the force needed to lift it without the ramp?

Now adjust the ramp to be 20 cm. at the top. Predict the force needed this time. Allow teams to announce their predictions to the class and explain how they chose them. Try this with one student holding the ramp to keep it steady. Compare answers to predictions and the first trial and discuss as a group.

Next repeat at a height of 30 cm. Be sure to share predictions again. Were the predictions closer this time? Discuss results. At what point would the inclined plane no longer be effective? (Straight up)

Ask each student to write a rule that describes the relationship between the angle of the inclined plane and the force needed to lift an object up the plane.

Most students will write: As the inclined the plane gets steeper, more force is needed to lift an object up the plane.

The complete answer is: As the inclined the plane gets steeper, more force is needed to lift an object up the plane, but the force is always less than lifting the object without the inclined plane. (This is the advantage of using an inclined plane; using less force to lift an object.)

In this activity, we lifted a mass 10, 20, and 30 cm. using an inclined plane. Even though the force was more as the ramp got steeper, it was always less than when we lifted it to any height without the ramp.

What is the disadvantage of using the inclined plane? Although less force is needed to lift an object, you have to use the force for a greater distance. You can also slip on the ramp, especially if it is very steep.

THE MATH: (This part is more for the teacher.)

The **Ideal Mechanical Advantage (IMA)** is a ratio of the ideal amount of force needed to lift an object using an inclined plane. It is determined by dividing the length of the inclined plane by its height. For example, if an incline plane were 40 feet long and 4 feet high, its IMA would be 10. This means you could slide a box weighing 400 lbs. up the ramp using one-tenth of that force or 40 lbs. You would be multiplying your force of 40 lbs. times 10 to lift 400 lbs. However, an inclined plane is never ideal as friction holds the box back, so it would take more than 40 lbs. of effort to lift the box. But it would take much less than 400 lbs. Putting wheels under the box would reduce the friction and allow us to get closer to the ideal in lifting the box.

The Actual Mechanical Advantage is what we really get out of using the inclined plane. It is determined by dividing the weight of the box by the effort needed to lift it up the ramp. In the example above, it might take 80 lbs. to slide the 400 lb. box. So, the AMA would be $400/80$ or 5.0. This means we are lifting an object that is 5 times heavier than the effort we use to lift it.

Measuring Work: In this example, let's assume that the ramp is 40 feet long and 4 feet high. Work is measured by multiplying the mass of an object, or the force needed to lift it, times the distance the mass is moved or lifted.

$$\text{WORK} = \text{Force} \times \text{Distance}$$

If we lifted the 400-lb. box without the ramp (Wow!) to a height of 4 feet, it would take 4×400 or 1,600 ft.-lbs. of work. Most of us can not lift 400 lbs., so we need the help of the inclined plane. If we had to push with 80 lbs. of force on the box for a distance of 40 feet., it would take 80×40 or 3,200 ft.-lbs. of work to do the same job. That is twice the work, but we would be able to push 80 lbs. whereas we could not lift a 400-lb. object. We would just need to push it further. This is the disadvantage of the inclined plane. We do more work, but the work is easier to do.

Forsyth County Air Quality and Environmental Education Workshop

During this one-day workshop, participants will be introduced to classroom activities and educational resources for teaching on air, air pollution, and solutions to air quality problems. Workshop facilitators will pull in additional local environmental professionals who specialize in topics including stormwater and solid waste management. Participants can earn six hours of CEUs through the Winston-Salem/Forsyth County School District and/or six credits through the North Carolina Environmental Education Certification Program. They also will be given a resource folder and other materials to take home with them. Workshop facilitators include NC Air Awareness with the North Carolina Division of Air Quality and Triad Air Awareness with the Forsyth County Office of Environmental Assistance and Protection, and we are hosted by the Winston-Salem State University's Education Department. When: March 4, 2024 Time: 9am - 4pm Cost: Free but must register in advance Where: Suite G19, Anderson Center Winston-Salem State University 1545 Reynolds Park Road Winston-Salem, NC 27110 Please note: Light refreshments will be provided, but participants will need to make their own arrangements for lunch. Free Event Parking

To register or to ask questions about this workshop, contact Sarah Coffey at coffeyse@forsyth.cc or call 336-925-4952.

Important Dates

February 3-4, 2024: 2024 Youth Climate Summit Museum of Life and Science, Durham, NC

March 20-23, 2024: NSTA National Conference, Denver, Colorado

April 5-7: NC FRC State Championship Competition, East Carolina University, Greenville, NC

April 12-13, 2024: State Olympiad Tournament, NC State University, Raleigh, NC

April 26-27, 2024: NC Envirothon State Level Competition, Burlington, NC



Museum Openings

In conjunction with its annual STEM Expo, the North Carolina Museum of Natural Sciences-Greenville opened at its new location (Cupola Building, 226 W. Eight Street, Greenville, NC) on February 2, 2024.

The N.C. Museum of Natural Sciences at Contentnea Creek, (949 Contentnea Lane, Grifton, NC) will celebrate the opening of the Nancy and John Bray Environmental Education and Visitors Center at 10 a.m. Saturday, Feb. 10.

The Reflector is accepting articles from the NCSTA membership.

Submissions may include teaching tips or lesson plans, summaries of science centered student or school projects, or teacher engagement in science teaching or scientific research. You may submit your article for possible publication in The Reflector to durham@campbell.edu.